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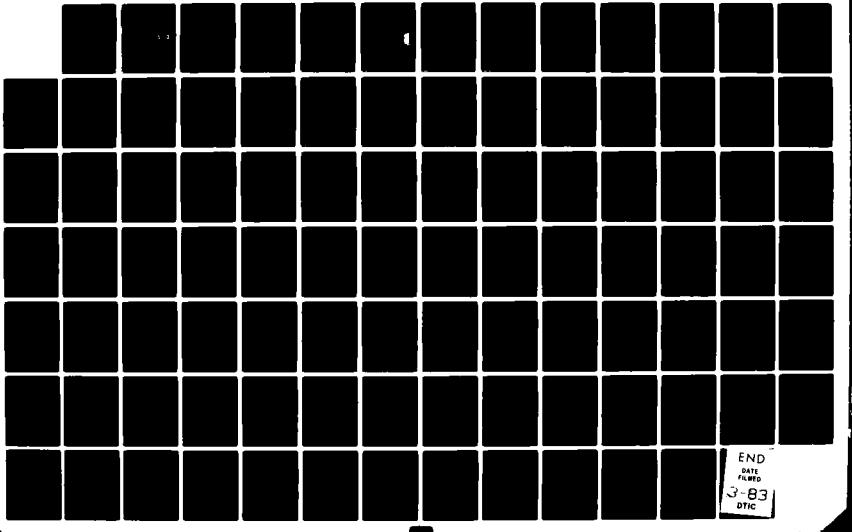

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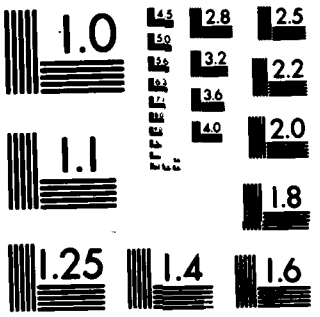

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ABSTRACT

DANNY JAMES SHARON, Master of Science, 1982.

Major: Medical Technology

Title of Thesis: A Managerial View of Myers-Briggs Personality Types in the Clinical Laboratory

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ABSTRACT

The influence of personality on occupational choice and work behavior is a widely accepted theory in managerial science. The purpose of this study was to consider the influence of personality on selection of a laboratory specialty controlling for certain demographic variables, and to examine the relationship between personality and job tenure in a sample of 141 medical technologists and medical laboratory technicians using the Myers-Briggs Type Indicator as an instrument. Three types, ISFJ(24.1 per cent), ESTJ(14.2 per cent), and ISTJ(12.8 per cent), out of the sixteen possible ones, accounted for approximately 51 per cent of the sample. One index of the personality, judging/perceiving, showed a weak relationship to choice of specialty unaffected by any of the demographic variables. Three indices, correlated weakly in a positive direction with job tenure: introversion, sensing, and judging. It was concluded that the clinical laboratory profession does attract a group of individuals with a particular set of personality characteristics and that this influence extends to selection of a specialty. In additon, an

individual whose personality type corresponds with that most often found in the profession is more likely to remain for a greater length of time in the career field.

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A MANAGERIAL VIEW OF MYERS-BRIGGS PERSONALITY TYPES IN THE CLINICAL LABORATORY

By

DANNY J. SHARON

A Thesis
Submitted to the Faculty of
Mississippi State University
in Partial Fulfillment of the Requirements
for the Degree of Master of Science in Medical Technology
in the Department of Biological Sciences

Mississippi State, Mississippi

December, 1982

A MANAGERIAL VIEW OF MYERS-BRIGGS PERSONALITY

TYPES IN THE CLINICAL LABORATORY

By

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ABSTRACT

DANNY JAMES SHARON, Master of Science, 1982.

Major: Medical Technology, Department of Biological Sciences

Title of Thesis: A Managerial View of Myers-Briggs Personality Types in the Clinical Laboratory

Directed by: Barbara H. Turner, Ph.D.

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ABSTRACT

The influence of personality on occupational choice and work behavior is a widely accepted theory in managerial science. The literature indicates that the effect is constrained by a number of situational factors, but it retains enough pragmatic value to warrant an attempt by managers to create a compatible fit between the individual and the work setting. The purpose of this study was to consider the influence of personality on selection of a laboratory specialty controlling for certain demographic variables, and to examine the relationship between personality and job tenure in a sample of 141 medical technologists and medical laboratory technicians using the Myers-Briggs Type Indicator as an instrument. Three types, ISFJ(24.1 per cent), ESTJ(14.2 per cent), and ISTJ(12.8 per cent), out of the sixteen possible ones, accounted for approximately 51 per cent of the sample. This result concurs with earlier findings by other researchers. One index of the personality, judging/perceiving, showed a weak relationship to choice of specialty unaffected by any of the demographic variables. Three indices, correlated weakly in a positive direction with job tenure: introversion, sensing, and judging. It was

concluded that the clinical laboratory profession does attract a group of individuals with a particular set of personality characteristics and that this influence extends to selection of a specialty. In additon, an individual whose personality type corresponds with that most often found in the profession is more likely to remain for a greater length of time in the career field.

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INTRODUCTION AND STATEMENT OF PROBLEM

Background

Studies considering the relationship between an individual's personality and numerous other factors such as choice of occupation, job satisfaction, job performance, motivation, and task design abound in the literature. Since the release of the Hawthorne studies in 1923 (Case and Zimmer, 1975), managers have been aware that one cannot exclude the human element when considering the work environment. Argyris (1964) and French (1974) go to great lengths to elucidate the need for fitting an individual to his environment and the consequence of not doing so. In addition to the pragmatic reasons they list, there is the pressure exerted on managers to maintain and maximize the efficiency of their human resources because of increased organizational competiton and the humanistic concerns of our society (Clark, 1975). All this serves as a stimulant for managers to know how an emplyee can be best utilized and retained.

The fit of an individual to an appropriate work environment involves several phases, but one thing is common to all these and that is personality. Argyris (1957) states that once one comprehends why people behave the way they do, it is easier to predict and control behavior. Since behavior is determined largely by personality (Lewin, 1951; Atkinson, 1981; Jaccard, 1981), it stands to reason that understanding personality will contribute greatly to this goal. The first phase of this process involves matching personality to occupation. Though this interaction can be affected by factors such as job availability and

occupational information (Blau et al., 1956; Youse and Clark, 1977), research substantiates the sizeable impact of personality on vocational choice (Roe, 1956; Rosenberg, 1957; Holland, 1973; Holland and Gottfredson, 1974). Roe (1956) states it well:

> "I have become more and more convinced that the role of the occupation in the life of an individual has much broader psychological importance than has been generally appreciated...Within limits, occupational choice can be taken as a self-categorization, as an indication of at least some aspects of the self-image."

The second phase of a comprehension process is a consideration of work behavior and attitudes once in the occupation. This has led researchers to examine the relationship of personality with factors in the work setting. The studies are numerous, but it can be concluded from their results that personality has differing degrees of effect and can yield unfavorable consequences when an incongruency exists. The most obvious of these conditions is role stress and its many ramifications. Perhaps the principal study in this area is that of Kahn, et al., (1964).

All of this has not been overlooked in the field of clinical laboratory science. Studies such as that of Colligan, et al., (1977) give impetus to the need of clinical laboratory managers to understand the relationship of the laboratory worker's personality and the laboratory environment. Their study ranked in descending order 130 occupations in the state of Tennessee by incidence of reported mental health disorders. The ranking was to serve as an index for the level of stres occurring in an occupation. Clinical laboratory technology ranked seventh from the top of the list. One cannot conclude that all of the stress they observed to be associated with the occupation is due to the personality of laboratory workers. However, based upon the evidence

regarding other worker populations, it does have some degree of influence . The need of this study is based upon that premise.

The study will focus on two areas. First, what is the relationship that exists between the personality of the individual who enters the clinical laboratory profession and the specialty in which he chooses to work? One can extend the theory that an individual selects an occupation supportive of his behavior, abilities, and values to selection of a specialty within that occupation in order to further enhance the match. A previous attempt by Williams (1976) failed to detect any significant associaton between personality and specialty choice. However, she did not consider what influence other factors may have had on the selection process. One of these was whether a subject was in the specialty he actually wished to be or was placed in whatever vacancy existed at the time of his initial employment. Other factors, such as the demographic variables of the subjects, will also be considered as to their influence on this relationship.

The second area of focus will be the relationship between personality and job tenure. This was suggested by the findings of other researchers that incongruencies between the personalities of the individuals and the tasks or roles they find themselves in will yield higher rates of turnover and attrition because of dissatisfaction or stress (Kahn et al., 1964; Townes and Wagner, 1966; Elton, 1971; House and Rizzo, 1972; Andrews, 1973; Showery, 1976; Bedeian et al., 1981; Mowday and Spencer, 1981; DeFlore, Cramer and Munz, 1981). Positive findings in this area will lend credence to the first focus area.

Therefore, the purpose of the research is to determine whether personality will influence the propensity to select an occupational specialty when controlled for certain variables, and to examine the relationship between personality and job tenure. Hopefully, this will contribute to the body of knowledge which clinical laboratory managers can apply when dealing with their subordinates.

Definition of Variables

The personality of the subjects in this study was determined by the Myers-Briggs Type Indicator (MBTI) (Myers, 1962; Myers, 1976). The MBTI is based on Jung's theory of personality types (1923). Jung believed that behavior in humans is orderly and premeditated. The behavior relies primarily on the means by which people prefer to perceive and gather data from their environment, and then to analyze or judge the data gathered. The former is referred to as perception and the latter as judgement. The differences observed between individuals are the result of these preferences and/or the strength of them. These differences manifest themselves as interests, values, motivations, and the degree they are felt by the individual.

The personality is structured by four dichotomous indices. The first of these is the EI index. It indicates whether an individual is extroverted (E), oriented to people and things, or is introverted (I), oriented towards concepts and ideas. The SN index reflects the preference for perceiving through sensing (S) or intuition (N). Sensing implies use of one or more of the five senses to gather data. Its dichotomy, intuition, is a preference to perceive the environment with ideas or associations the mind places on people or things encountered.

The TF index indicates the individual's preference for judging his perceptions. A person who prefers thinking (T) analyzes impersonally with logic and objectivity. Feeling (F), on the other hand, implies analysis and decisions based on the individual's personal values. The final index, JP, indicates whether an individual relys on a judging (J) or perceiving (P) process in his dealing with the outer world.

These indices yield sixteen possible combinations known as types which describe the personality traits one might observe in an individual. A summary of the types is provided in the appendix. The indices provide a better measure for associating personality differences to other factors as they are more specific than the types. In this study, main emphasis is placed on the indices with only a general examinaton of the types.

The demographic variables on the subjects were limited to age, sex, job classification, and the hospital in which the laboratory is located. Age was selected because of the relationship it has shown with personality in the development of the MBTI and in other studies (Martin, 1981). Sex was chosen since the TF index is known to be correlated with this factor (Myers, 1962). The test is weighted to control for this interaction and is expected to produce about 60 per cent thinking males, 40 per cent feeling males, 33 per cent thinking females, and 67 per cent feeling females for a typical sample. Validity tests indicate that these figures are representative of the adult population (Myers, 1962). Job classification was intended to encompass several factors. Dietrich (1977) cites many studies that demonstrate the influence of an individual's background on the education level he may attain. These same factors are involved in personality development. Dietrich compared

the personalities of medical technologists, requiring at least a baccalaureate degree and medical laboratory technicians who obtain at least an associate degree. She found a few significant, but weak, differences between the two classes. Because of her results, this variable was controlled for in this study. Hospital or facility was included to control for any effects of a geographical or cultural nature.

The specialty in which the subject currently worked or preferred to work was given four designations: 1) chemistry-urinalysis, 2) hematology-coagulation, 3) blood bank-immunology, and 4) microbiology. Any one working in nuclear medicine, toxicology, or special chemistry was included in the first category. A person working in parasitology or mycology was placed in the last category. The specialties were grouped as such to correspond with the groupings employed by Williams and because they represent the functional structure found in a majority of clinical laboratories. The function and technology of each deprtment places them on a continuum of task structure. Task structure is defined as the extent that the inputs, processes, and outputs of a task are known and predictable (Kahn et al., 1964).

Job tenure represented the subject's total accumulated work experience not including that obtained while a student. As stated earlier, turnover and attrition has been found to be a symptom of work dissatisfaction or stress which may be related to an incompatible match between the individual and the job. Tenure was selected as an index of turnover and attrition as it could be obtained directly from the respondents on the questionnaire. To obtain data on turnover and attrition, personnel records would have to be obtained and screened.

Turnover rate is not seen as an acceptable measure of this effect because it does not relate directly to the individual whose personality is being measured, and because personnel records may not be accurate or complete.

Job status or level occupied in the organizational hierarchy was not included among the variables. Samuel and Lewin-Epstein (1979) showed that job situs, which is functional location in the organization, appeared to have a greater influence on work values than job status. Miles (1976) found that organization level or status had no effect on the degree of perceived role ambiguity or conflict. French and Rezler (1976) in evaluating the personality and job satisfaction of female medical technologists found this to be true for the most part in the laboratory. Technologists whose duties consisted mainly of education or administration, thereby holding a higher status than those who performed the laboratory procedures, demonstrated few personality differences from the clinical practitioners.

The influence of race on the personality of laboratory workers is rather ambiguous. Hill (1974) was able to demonstrate some qualitative personality differences between black workers in a predominantly black laboratory in Washington, D.C. and white workers in a predominantly white laboratory located in a small university town in Florida. Hill's results are suspect though. He limits his sample to one hospital of each race separated geographically and culturally. He also fails to control for other factors which may have influenced the distribution of the personality types. William's (1976) study included a small number of blacks in her sample, but they possessed no particular differences in personality traits. For this reason, race is excluded from this study

as a controllng variable.

Hypotheses

Based on the focus and purpose of the study, the following hypotheses were formulated.

H.1: The specialty in which an individual prefers to work is associated with personality when controlled for certain variables.

H.2: Personality is correlated with job tenure.

H.3: An individual whose personality type corresponds with that most often observed in the profession has longer job tenure than those who do not.

LITERATURE REVIEW

This review of literature considers first the effect of personality on occupational choice, on task/person fit, and on work behavior and attitudes for the general population. The focus then narrows to workers in the clinical laboratory. Their work environment is described and defined in terms that prescribe congruent personality characteristics. Following this, the actual personality characteristics of these workers are drawn from previous studies. Findings from studies not using the MBTI are rephrased into this typology to elucidate consistencies that exist. It also allowed a synthesis of the characteristics to be made which can be compared to the work environment characteristics. Finally, the work attitudes and behaviors observed in clinical laboratory workers is described and related to the findings and conclusions made about the general population.

Selection of an Occupation

The occupation an individual chooses is the outcome of a complex decision process. One of the main forces involved in this process is the personality. Roe (1956) described this influence as an attempt on the part of the individual to categorize his self image. She did not exclude the situational factors having an effect on this decision, but conclusively reasoned that the attraction of individuals with a particular grouping of personality characteristics to specialized occupations was based on perception of that environment being able to meet certain needs within the individual. Rosenberg (1957) stated that

the progressive exclusion of occupational alternatives was to a great extent due to the individual's perception of what degree the behavioral requirements of an occupation would harmonize with his personality structure. The occupation an individual chooses is based on his values and the attitudes he has towards that particular job. However, personality does not apper to be the single major determinant of occupational choice. Blau, et al., (1956) were able to show that other factors such as job availability and amount of occupational information available, also, played a key role in these decisions.

To further understand the role of personality in occupational choice, a deeper insight into what constitutes personality is required. Personality has already been defined for this study as the behavioral preferences an individual has when dealing with his inner and outer environment (Jung, 1923). However, what is it that determines these preferences? Argyris (1957) says that personality is a "whole created by the interrelationships of the parts..." and is labeled as the self. These parts are identified by him as the needs of the person and as the abilities which arise from his attempts to express and fulfill those needs. The needs of an individual influence his behavioral preferences as described by Jung (Eysenck, 1967; Maslow, 1970). These preferences in turn determine the abilities which emerge from that person. For example, an introvert will have different needs from an extrovert (Eysenck, 1973). The preference, extroversion or introversion, will determine what behavior will be exhibited when a situation is confronted that leads to or prevents goal attainment. If this behavior is successful in obtaining the goal, the preference is reinforced and the ability is developed (Skinner, 1969). Lewin (1951)

provides a function to illustrate this process: B=f(P,E) where B is behavior, P is personality, and E is environment. Argyris states that as the individual becomes aware of this process within him, he develops a self image which is a perception of his weaknesses, strengths, temperament, and abilities. It is this self image or personality which exerts itself at the time of the occupational choice and continues to influence later work behavior and attitudes.

Many studies provide empirical evidence of the role of personality in occupational choice. Holland (1973) in updating his theory of occupational decisions based on his measure of personality, the Self Directed Search (SDS), cites numerous studies which substantiate this theory. Elton (1971) determined that freshman males transferring to the Arts and Sciences school from the Engineering school had different personality typologies than those who remained. He could not show a difference between students in a four year institution and those in a community college because of the diversity of the latter student's personalities. His results supported that not only does personality influence career paths to provide a congruent work setting, but that the environment an individual chooses will enhance or weaken development of personality characteristics. Brousseau and Prince (1981) in examining the effect of task characteristics on personality development of scientists, managers, and engineers, confirmed this latter finding of Elton. They concluded that the effect is small, however, and that factors such as marriage, family, and health play a larger part. A survey of 89 adult males enrolled in night classes of a community college demonstrated significant movement towards work environments more compatible with their personality types than their present work

environments (Andrews, 1973). Holland and Gottfredson (1974) added support by finding that a person's SDS typology was an efficient predictor of the category of a later vocational choice.

To summarize, personality, constrained by other external factors, plays a key role in determining an individual's occupational choice. The cause of this relationship appears to be a deliberate attempt by the person to select a work environment that is compatible with his needs, values, abilities, and self image. The work environment in turn feeds back to the persosality having a small influence on its continuing development (Brousseau and Prince, 1981). The next step is to examine this interaction extended to the task level and consider how it affects behavior and attitudes.

Interaction of Personality and Task

Attempts to find an appropriate task/person fit do bring about improved quality of work life and, in some cases, improved productivity (Huse, 1980; Hellreigal and Slocum, 1978). Perhaps the best summary for this theory is provided by French (1974). He defines two components of fit. The first is the degree that a person's skills and abilities match the demands and requirements of the job. It was stated earlier that abilities are influenced by the behavioral preferences of the individual. The second component of fit is the degree to which the needs of the person are satisfied in the task environment. Again, it was concluded earlier that needs are the precursers for the behavioral preferences. From this, one can see that personality is associated with a propensity to choose a specific work environment and with the behavior and attitudes exhibited in that setting.

There are a number of studies describing the effects of task/person fit. Vroom (1960) published the results of a study which confirmed that an individual's need for independence, the personality variable, combined with the extent to which participation in decision-making in his job was perceived as being allowed would determine his attitude (satisfaction) and effective performance (motivation) for that job. The significance of his study lies in that it was revealed that people will differ in their need for independence and that a compatible work environment can be found which will enhance satisfaction and motivation. Tuckman (1968) tested 95 first line supervisors to study the degree of satisfaction with their present job as a means of maximizing the predictive value of personality factors. Using the Interpersonal Topical Inventory as a measure of personality, Tuckman was able to demonstrate a weak, but significant, relationship between personality, job environment characteristics, and the degree of job satisfaction. Persons prone to be anxious and needing structure tended to be more satisfied in a structured and nurturing environment which offered little autonomy. This relationship continued on up the continuum. Other studies support Tuckman's findings. The location of a person on a continuum of higher-order or growth needs predict the satisfaction, performance, turnover, attrition, and absenteeism of the individual in a particular work setting (Macy, 1975; Steers and Mowday, 1977; Mowday and Spencer, 1981). This relationship is moderated, however, by other factors such as technology (Abdel-Halim, 1981), social supportive actions within the work environment (French, 1974), and the current labor market (Hellriegal and Slocum, 1980).

Another study of Kim (1980) revealed that an individual's personality defined as the degree of extroversion and neuroticism was able to predict job satisfaction, expectancy, and motivation potential of a task, but not job performance when confronted with a non-stimulating or stimulating task. Introverts were less dissatisfied with non-stimulating tasks than extroverts, and extroverts were more satisfied with stimulating tasks than introverts. For stimuulating tasks only, the extroverts and low-neuroticism individuals indicated a higher level of expectancy and motivation potential than did introverts and high-neuroticism individuals. No differences were observed for the non-stimulating tasks.

Bedeian, et al., (1980) found that the personalities of 202 male and female nurses were correlated significantly, but to a small degree, to role ambiguity and to a lesser extent to role conflict. The more flexible and outgoing individuals were, the less they experienced either of these two components of role stress. The small degree of correlation was explained by the constraining effects of education level, tenure, professional commitment. The significance of their findings is magnified by the results obtained by House and Rizzo (1972) who demonstrated a negative relationship between role ambiguity and to a lesser extent role conflict and perceptions of organization effectiveness and job satisfaction. In addition, they revealed a positive relationship between anxiety, which is related to role stress, and an individual's tendency to leave a job. The implication is that an improper match between personality characteristics and task environment characteristics is involved in numerous unfavorable behavioral outcomes of which role stress, particularly role ambiguity, may be the cause.

Bedeian et al., (1981), in a study originating from their 1980 research, concurred with the results of House and Rizzo.

The most comprehensive study in this area from which many of the preceding ones use as a basis is the research performed by Kahn et al., (1964). They listed a number of organizational, outcome, and individual variables that are interrelated and interdependent with role conflict, ambiguity, and overload. The individual variables include personality characteristics such as anxiety proneness, flexibility-rigidity, and self-esteem. Outcome variables are aspects of job satisfaction, job related tension, and mental health disorders. Organizational variables include such things as structure, level in the organization, role requirements, task characteristics, physical setting, and organization practices. One of their conclusions was that the personality of an individual largely determines which outcome variables will occur and to what degree they will occur when moderated by organizational variables. Their finding has a significant impact on the later discussion of laboratory worker's personality interactions.

To summarize, personality is known to be a significant influence in occupational choice, task/person fit, and subsequent work behavior and attitudes. Its influence is greatly moderated by numerous factors which explains why at times it appears to have little or no effect. The unfavorable consequences of this interaction are a result of stress which occurs when an incongruent match exists or circumstances occur which conflict with personality. With this as a background, the role of personality in the clinical laboratory professison can be examined.

Personality and Work Interaction in the Clinical Laboratory

The research to date indicates that persons attracted to and remaining in the clinical laboratory profession have a consistent set of personality traits. The discussion that follows demonstrates how these particular characteristics and the clinical laboratory work enviornment interact with one another. Conclusions regarding the general population will be used to interpret results of studies that reveal the attitudes and behaviors of laboratory workers.

Clinical Laboratory Work Environment

Concisely, the work consists of handling specimens from the human body and the scientific analyses of constituents in those specimens. As a whole, the work is orderly, highly regulated, and structured. It deals primarily with facts and details, and requires rapid production of results with extreme accuracy and precision. Most laboratories are automated to a great extent in all or most of the departments. The two general classifications of workers, medical technologists and medical laboratory technicians, perform essentially the same tasks despite the former classification requiring at least a baccalaureate degree in most cases and the latter at least an associate degree (Reynolds et al., 1976). Rewards are given primarily on the basis of performance and technical competence (Day and McClure, 1980).

The laboratory, depending on the size, is usually divided into at least four functional specialties or departments each having a degree of task structure. Task structure is defined here as the extent to which an individual can predict the inputs, processes, and outputs of his task (Kahn et al., 1964). The chemistry department is the most automated and

routinized specialty. The specimens received and tests requested are consistent and usually predictable. Procedures and outputs are highly controlled through mechanization and quality control procedures. It has the greatest degree of task structure. Hematology is a second department. This speciality is also highly automated, but not to the extent that chemistry is. Inputs, processes, and outputs are, also, controlled and predictable, but there is slightly more variability in the processes and outputs because of such procedures as white blood cell differentials and special hematology. These procedures involve some degree of subjectivity. The task structure is less than in chemistry. Immunohematology or blood bank is a third department. The processing phase is highly controlled by extensive standard operating procedures and policies, but little automation is utilized. The inputs and outputs vary greatly. This is due to the variety of procedures which may be requested and the great fluctuations in the frequency they occur. Also, it is due to the unpredictable nature of the specimen's constituents being analyzed. Task structure is much less than the two previous departments. The last department, microbiology, has the least amount of task structure. Type of specimens received and the tests requested vary considerably in frequency and nature. There is little or no automation to perform the analyses, and much of what is done is subjective. Control is maintained by standardized procedures and quality control checks. Outputs are limited only by the large number of microbiological organisms one may encounter.

If the theory is correct, there should be a relationship between the personality and characteristics of the work environment. In addition, one may expect to see favorable consequences for a compatible fit and

describe factors in the environment which will cause conflict for the individuals in it.

To elucidate the relationship between the two, the description of the clinical laboratory will be defined in terms provided by Holland (1973). Holland devised six environment descriptors just for this purpose. Roe places the laboratory technician in a scientific-technical category. This classification corresponds to two Holland descriptors: investigative and realistic. Therefore, a combination of these will define the laboratory setting in terms that can be more readily compared to personality traits.

The realistic enivronment is characterized by behavioral requirements and opportunities that include the "...explicit, ordered, or systematic manipulation of objects, tools, machines, and animals..." (Holland, 1973). The environment encourages technical competencies and achievements. It reinforces mechanical abilities and practicality, but demphasizes human relations.

The investigative environment is represented by demands that include the "...observation and symbolic, systematic, creative, investigation of physical, biological, or cultural phenomena..." (Holland, 1973). It encourages scientific accomplishments and competencies. It reenforces people to see themselves as adept with mathematics and science, and as being independent and rational. But, it fosters an image of lacking leadership skills and compassion.

So what one sees is a work environment that is both scientific and production oriented. Next, the personalities of the laboratory workers will be examined. From this typology of the work setting, a personality

type that is a composite of the dual scientific-technical nature or one or the other is expected to emerge.

Personality Studies of Clinical Laboratory Workers

The personality structure of workers in clinical laboratory science has been described by a number of researchers using an assortment of instruments. In 1966, Dunteman used the Minnesota Multiphasic Personality Inventory (MMPI) to assess the personalities of 45 females expressing a desire to enter a medical technology education program. The subjects fell primarily into two groups. The first group was described as being thoughtful, idealistic, perservering, boastful, unemotional, and inarticulate. This typology corresponds to an MBTI I_TJ type. The second group was described as being naive, neurotic, dependent, indecisive, high-strung, hostile, irritable, and lacking self-control. This is similar to Myers description of I_FP types.

Holmstrom (1975) conducted a longitudinal study of 9,604 laboratory technicians (both classifications included). The subjects expressed a preference to work with things rather than people and to make a theoretical contribution to science. This is indicative of introverted, practical, and detached personality traits as one would see in an IST_ typology. They rated themselves high on sensitivity to criticism, stubborness, defensiveness, and political conservatism; and low on leadership, drive to achieve, popularity, and public speaking ability. These latter traits are comparable to an IS_J combination of MBTI indices.

A study of 70 male and female paraprofessionals, including laboratory technicians, who worked in a rural health care system revealed that the subjects were conforming, conservative, submissive,

highly anxious, insecure, introverted, moralistic, undisciplined, suspecting, and happy-go-lucky (Romero, 1975). This typology resembles the latter group noted by Dunteman (1966) and the sample described by Holmstrom (1975). It is suggestive of an IS_P MBTI typology. The unusual perceptive (P) index may have been associated with the fact that the majority of the paraprofessionals in his sample were Mexican-Americans or native Americans. This was not statistically tested for in the study.

Dietrich (1977), using the California Psychological Inventory (CPI), assessed the personalities of medical technology and medical laboratory technician students and compared it with the Holland personality typology for laboratory workers. Dietrich compiled an exhaustive literature review of personality studies on these workers and concluded on the basis of previous research that they fall into the investigative-realistic sector's of Holland's schema. The investigative type is described by Holland as task-oriented, unpopular, asocial, critical, introverted, passive, precise, methodical, analytical, inarticulate, pessimistic, and cautious. The realistic type is apt to be asocial, conforming, matter-of-fact, persistent, practical, self-effacing, dependable, orderly, systematic, and possessive of good motor skills. The former type is suggestive of an MBTI INTJ type and the latter of an IS_J type. The results of her study revealed that there were only a few weak differences between the personalities of medical technology and medical laboratory technician students. Overall, the personality of the subjects was described by the CPI as asocial, introverted, favoring achievement through independence and autonomy, conservative in thoughts and actions, normally responsive to the needs of others, cautious, and

self-controlled. This description leans towards the INTJ or INFJ type. The medical laboratory technicians possessed more practical traits similar to the realistic or IS_J type.

The remaining studies to be cited used the MBTI as the instrument to measure personality structure. Bowling (1973) found that 57 per cent of her sample of working medical technologists were either ESTJ, ISFJ, ISTJ, or ESFJ types in descending order of occurrence. She made no distinctions as to race, sex, age, or job status. Bowling concluded that the majority of the sample favored precision, variety, organization, and harmony in a work environment. Hill (1974) measured the personalities of workers in a predominantly black clinical laboratory and workers in a predominantly white laboratory. He found that the majority of the blacks were an _STJ type, which are described as being practical, analytical, nonaltruistic and organized. Most white laboratory technicians preferred ESFJ and most white medical technologists preferred INFJ. This indicated that technicians are more extroverted and realistic than technologists. However, based on mean scores of the preference strengths, no significant differences for any of the indices were noted between the two races. The qualitative differences noted by Hill may possibly be explained by cultural, geographical, or demographic differences for which he did not control. Williams (1976) tested 306 female working medical technologists distributed among several large teaching hospital laboratories. The following five types in descending order of occurrence accounted for approximately 56 per cent of the sample: ISFJ, ISTJ, ESFJ, INFJ, and INFP. Williams also tried to detect an association between personality type and specialty, but found no significant relationships. A study by

French and Rezler (1976) obtained similar results. Sixty-three per cent of 56 clinical practitioners were clustered in types ESTJ, ISTJ, ISFP, and ISFJ. The remaining subjects who were administrators and educators, had the same traits except for a greater incidence of intuitive (N) preferences in place of sensing (S).

To summarize, the studies, though some of the samples are small, appear to be describing the same personality characteristics with minor variances. The MBTI analogies for each study indicate a consistent cluster of types to be occuring in each sample: ISFJ, ESFJ, ISTJ, and ESTJ. In a few studies, there is a greater proportion of intuitive (N) and and perceptive (P) types. This would correspond to Holland's investigative descriptor which was expected to be present. The majority of the subjects are more realistic or a composite of investigative-realistic. The observation that students entering the field have nearly identical characteristics as working laboratory technicians supports the findings of Blau et al., (1956) which stated the environment has little effect on personality development. Rather, it supports the theory that persons enter an occupation perceiving that it has behavioral requirements or opportunities congruent with their personalities and abilities. A general summation of the characteristics of these MBTI types is as follows: realistic, practical, observant, good at working with and remembering facts, preferring to work in a planned and orderly manner based on facts and experience, adaptable to routine, dependable, valuing competence, and somewhat independent. These personality traits are congruent with the work environment characteristics of the clinical laboratory. Based on this information, it is expected that this study will yield a similar cluster of types. William's attempt to align

personality types with laboratory department did not succeed. However, intuitively, one may see the possibility of a relationship between the two moderated by the degree of task structure found in the specialty and the strength of the individual's need for order and routine.

Behavior and Attitudes of Clinical Laboratory Workers

It was noted earlier that a number of studies substantiate the role of personality in interacting with environment to determine work attitudes and behavior. Personality serves not only as a moderator in reacting to stress, but as a source of stress when the person/task fit is incompatible. Kahn et al., (1964) provided the most comprehensive study and basis for subsequent studies of this effect. From their observations, a dichotomous personality trait was described which had much to do with this influence: rigidity-flexibility. Their definition of rigidity was a person who liked an orderly process, clear standards, and deadlines. They place great importance on precision and excellence of the work they performed. Recogniton for good performance and expertise-achievement needs served as their primary motivators. Rigid persons experienced two fundamental work environment stressors: 1) deadlines that interfere with an orderly process for completing an assignment within the prescribed standards of precision and excellence; and 2) work situations that are not clearly structured, responsibilities that are not sufficiently and clearly defined, and a lack of order in the work routine. In general, they have a low tolerance for ambiguity. Inversely, a flexibile personality would find these conditions, if present, to be restrictive and stressful. They prefer ambiguity.

Kahn et al., (1964) collected their data from an industrial setting, yet their description of the personality and compatible work environment characteristics for rigid persons are strikingly similar to those of the clinical laboratory. The researchers went on to say that the presence of these stressors was likely to cause perceived task ambiguity for a rigid person. The ambiguity experience led to tension and anxiety with a corresponding reduction in the person's ability to meet the work demands and requirements, as well as an increase in stress related mental and health disorders. Job dissatisfaction and a sense of futility were likely to occur. From the previous studies, it is known that dissatisfaction can be directed at perceptions of opportunities for advancement, recognition, autonomy, supervision, and intrinsic job satisfaction (House and Rizzo, 1972; Steers and Mowday, 1977). This evidence leads to the supposition that occurrence of stress, dissatisfaction, turnover, attrition, or absenteeism in the clinical laboratory could be due to this personality-environment interaction.

Showery (1976) surveyed 300 student and working laboratory personnel and found that 49.5 per cent of them would not choose their profession again if given a choice. The two reasons cited most often as the cause of their dissatisfaction was lack of recognition and respect as well as constant disruption of orderly work processes by emergency requests.

French and Rezler (1976) found that clinical practitioners in their sample were dissatisfied with pay and promotion opportunities. They found no relationship between personality and job satisfaction. A common source of frustration for them was poor communication which is related to task ambiguity and structure.

Williams (1976) found that medical technologists, particularly those who were thinking types and who worked in chemistry, were dissatisfied with pay, promotion opportunities, co-workers,, and the job itself. She found no other relationships between personality and job satisfaction. That she discovered a small association between personality and job satisfaction whereas French and Rezler (1976) did not, indicates the specific task environment in which the individual is placed must be considered when examining this interaction. This is consistent with the theory that environment serves as a moderator of the influence.

Colligan, et al., (1977) ranked occupations in the state of Tennessee as to the incidence rate of diagnosed mental health disorders. The ranking was to serve as an index for the amount of stress experienced by occupational incumbents. Of 130 vocations, clinical laboratory technology ranked seventh highest. Though the researchers listed reasons other than a greater occurrence of stress as possible causes of their findings, they still concluded that the index would serve its intended purpose adequately.

Love (1977) noted an interesting paradox in attitudes of laboratory workers. The workers indicated a desire for their supervisors to use their authority to provide order, clarify specifications of work methodologies and role definitions, and structure their tasks. However, they, also, saw the supervisor's use of authority as limiting their autonomy and creativeness thereby lessening their satisfaction with work content. Love concluded that medical technologists prefer a supportive, well-structured environment that allows them an opportunity to maintain some degree of control over their work enviornment through participation.

Harting and Oliver (1978) found that medical technologists were most dissatisfied with rewards for work performed, fulfillment of occupational ambitions, and recognition for good performance by persons external to the laboratory. They noted that the workers were quite satisfied with the job itself and the physical environment. Oliver (1978) contributed to those findings by adding that technologists who valued doing what is socially correct, following regulations closely, doing what is accepted and proper, and being a conformist were most satisfied with their rewards, with the extent to which they felt a part of the total health care team, and with public recognition. Individuals who valued independence and recognition (esteem) were most dissatisfied. The parallel of these results with those of Kahn et al., (1964) is obvious.

Griffin and Klun (1980) asked working medical technologists to rank order a list of stressors that they had developed from literature review and personal experiences. Overall, the three most significant stressors in descending order were 1) the failure of physicians to understand the laboratory situation, and/or pressing them for rapid return of test results; 2) emergency requests which disrupt the normal work routine, and 3) the pressing need for extreme accuracy. All of these correspond to the stressors Kahn et al., (1964) listed for the rigid person.

Myers, et al., (1982) surveyed 175 medical technologists, most of whom were clinical practitioners, and found that the majority were dissatisfied with their job. The sources of dissatisfaction were lack of promotion opportunities, lack of recognition by other health professionals, job stress, and low pay.

Hajek and Blumberg (1982) surveyed 83 medical technologists who had left the profession. Respondents who had not left for domestic reasons cited lack of promotion opportunities, inability to fully apply their skills and abilities, routineness of their job, and lack of supervisory support in motivation. Hajek and Blumberg concluded that technologists are over-trained for their current responsibilities. This may be true, but their conclusion fails to include the findings of other researchers already cited that indicate technologists with equivalent training, but congruent personalities do not have a problem with these factors.

To summarize this section, it is concluded that laboratory workers whose personalities are congruent with the behavioral characteristics of the work environment will experience less stress and dissatisfaction than those who are not. Subsequently, this fit should manifest itself in either decreased turnover, attrition, or absenteeism.

Summary

The role of personality factors in occupational choice, work interaction, and work behavior and attitudes have been described for the general population and for the clinical laboratory. Overall the laboratory worker is seen to have a personality characterized as realistic, practical, observant, prefering to work in a planned and orderly manner based on facts and experience, adaptable to routine, dependable, valuing competence, and somewhat independent. These characteristics are compatible with the environmental characteristics. Persons who do not have this personality typology and enter the occupation are likely to be dissatisfied and possibly leave the profession or exhibit other dysfunctional behavior. In addition,

situations which alter or constrain the environmental characteristics are likely to be stressful to the majority of the occupation's incumbents.

METHODOLOGY

Subjects

The subjects were medical technologists and medical laboratory technicians or an equivalent classification employed in the clinical laboratories of three metropolitan teaching hospitals: Baptist Memorial Hospital (BMH) and Methodist Hospitals of Memphis Central (MHMC) in Memphis, Tennessee; and Mississippi Baptist Medical Center (MBMC) in Jackson, Mississippi. All employees of each laboratory were informed of the study in advance through the program director of the medical technology school located in the hospital. All participants were volunteers induced with an appeal to contribute to this body of knowledge, a confidential report and description of their type, and a summary of the study results to be distributed by the school of medical technology program director. A copy of the cover letter bearing this information is in the appendix. No distinctions were made as to the race of a subject, work shift, or job title (clinical practitioner, educator, or administrator). Students were not tested as the inferences made in this study apply to working medical technologists and medical laboratory technicians.

The original sample was composed of 151 subjects. From this, ten were deleted because they either indicated their specialty as a generalist or classified themselves as being over 55 years of age. This small number of individuals who met these criteria interfered with the statistical analyses by causing more than 20 per cent of the cells in the contingency tables to have an expected cell frequency of less than 1.0 (Mainland, 1948; Lancaster, 1950; Cochran, 1954). The final sample

consisted of 141 subjects representing a finite population of medical laboratory technical workers in large laboratories of metropolitan teaching hospitals.

Measures

Personality was measured using the Myers-Briggs Type Indicator (MBTI), Form G (Myers, 1962; Myers, 1977). The test consists of 126 forced-choice questions which produces a personality typology consisting of four dichotomous indices and their corresponding score or strength. The indices and type are explained in detail in the introduction. The MBTI was chosen for this study to allow easier comparison with earlier studies and because the type descriptions correspond to the work environment characteristics. A secondary reason for using the MBTI is the ease with which it can be applied in the work setting without extensive psychological expertise. The Form G, developed in 1975, is the most current instrument. It was selected because it can be administered and hand scored easily, requires less time to take the test, and has been updated to improve the validity of the test. In this sample, subjects required an average of 25 minutes to complete the test and the attached questionnaire.

The questionnaire (Appendix C) consisting of five items was designed specifically for this study. The items identified the subject's sex, age class, current job classification, total non-student work experience, current and preferred specialty. The variables were chosen to fulfill the purpose of the study.

Table 1 lists the operationalized variables for the study. The indices were operationalized in three ways. First, there was the dichotomous, qualitative preference of the index alone, for example

TABLE 1. LIST OF VARIABLES

Variable Name	Type of Variable	Description
SEX	Dichotomous	Male=1, Female = 2
AGE	Ordinal	Age Groups: 20-25=1, 26-30=2, 31-55=3
CLASS	Dichotomous	Job classification: Medical Technologist or equivalent=1, Medical Laboratory Technician or equivalent=2
CURSPEC	Nominal	Current Specialty: Chemistry-Urinalysis=1, Hematology-Coagulation=2,Blood Bank-Immunology=3, Microbiology=4
PRESPEC	Nominal	Preferred specialty: same coding as for CURSPEC
FAC	Nominal	Hospital: BMH=1, MHMC=2, MBMC=3
DIFF	Dichotomous	Desire to change specialty as indicated by a difference between CURSPEC and PRESPEC: yes=1, No=2
JOB	Continuous	Accumulated laboratory tenure excluding student experience
EI	Dichotomous or Continuous	Extrovert/Introvert index
SN	Dichotomous or Continuous	Sensing/Intuitive index
TF	Dichotomous or Continuous	Thinking/Feeling index
JP	Dichotomous or Continuous	Judging/Perceiving index
TYPE	Nominal	Sixteen four letter codes derived from the indices describing personality structure

either E (extrovert) or I (introvert). Second, there was a dichotomous, quantitative preference score of the index to measure the strength of that preference for the individual. The ranges for the scores are as follows:

E 52 . . . . 0 . . . . 58 I
S 67 . . . . 0 . . . . 51 N
T 49 . . . . 0 . . . . 51 F (males)
T 61 . . . . 0 . . . . 49 F (females)
J 55 . . . . 0 . . . . 61 P

Third, there was a continuous score for each index which is derived by adding the quantitative score to 100 if it is I, N, F, or P and by subtracting the score from 100 if E, S, T, or J. The first two variables are used to determine whether a subject's membership in a sample or a difference originating from personality traits is due to the simple preference alone, due to the strength of the preference, or due to both. Myers suggested that the continuous score cannot be used for this purpose as it confounds the effects of frequency and strength of preference. Therefore, the continuous score is restricted to correlations with other continuous variables, and is supplemented with statistical analyses of the qualitative preference of the quantitative preference score to obtain a full understanding of the effects of the index.

Type (TYPE) was analyzed as a nominal level variable. Statistical analysis other than an examination of the frequencies could not be performed due to the small number of subjects in several of the typologies. Age (AGE) was classified into three categories for two reasons. First, it was assumed the effects of age on personality would be more pronounced in this manner than as a continuous variable. The ages of the subjects were so widely spread that the effects would be too

small to generalize about the sample as a whole. Secondly, it was assumed that the sample would be roughly distributed evenly among the age categories. Sex (SEX), facility (FAC), and job classification (CLASS) are self-explanatory.

The subject's current specialty (CURSPEC) and preferred specialty (PRESPEC) were designated as four categories: 1) chemistry-urinalysis, 2) hematology-coagulation, 3) blood bank-immunology, and 4) microbiology. The variable DIFF was created by indicating an affirmative response if there was a difference between the subject's current specialty and preferred specialty, and a negative response if there was not. The purpose of the variable was to provide an index which would indicate to what extent subjects in the sample were placed in the specialty they wished to be. Tests of independence with this variable and the indices would detect a personality cause for wanting to work in a different specialty, but would not indicate which specialty.

Job experience (JOB) was measured as a continuous variable since its primary function in the study was to serve as a dependent variable. Inferences made about this variable would need to be as specific as possible. With the variables defined operationally, the statistical procedures used to analyze the data can be explained.

Analyses

The analyses were carried out in three parts using the Statistical Package for the Social Sciences (SPSS Level 8). (Nie et al., 1975). In the first part, the sample and subsamples were examined descriptively by computing the frequencies of each in the categories of the demographic variables, by the current and preferred specialties, and by DIFF. The

purpose of this analysis was to identify the nature of the sample from which inferences would be made, to identify the specialty distributions of the sample, and to determine whether the subjects in the sample and subsamples were placed in the specialty they wished to be. The subsamples were created in order to isolate any effects related to sex. At least one, an association with the TF index, was expected.

The second part of the analyses involved testing the qualitative form of the indices for independence from the sample and subsample demographic variables excluding job experience, current and preferred specialty, and DIFF. These tests were performed by constructing contingency tables and computing the raw chi square as a measure of significance. Raw chi square rather than Yeates corrected chi square for continuity was utilized in all cases as it is believed by this researcher that the latter provides too conservative a test (Cochran, 1954). This would cause some existing associations to be overlooked. Probability of a Type I error was held at the 0.05 level. The magnitude of any significant associations was determined with asymmetric lambda (Blalock, 1979) or in one case with the uncertainty coefficient (Theil, 1967; Theil, 1972; Nie et al., 1975). The simple Pearson product moment correlation was utilized for the measurement of the magnitude of association between job tenure and the continuous scores of the indices. Any significant associations between these variables were also examined by testing the mean difference scores of the indices for the purpose of determining whether the effects were qualitative or quantitative.

The third part of the analyses involved a non-statistical examination of the frequencies of each type and a comparison with

earlier studies. a statistical analysis could not be performed because of the small number of subjects in some of the types.

RESULTS

Description of the Sample

The sample consisted of 141 male and female medical technologists and medical laboratory technicians or an equivalent classification. The male and female subsamples were composed of 18 males and 123 females. The small number of male subjects proved to be a problem later when statistically testing the subsample's characteristics for associations with the indices.

The ages were distributed evenly when one considers the large range of the last age category. This was anticipated and stood as one of the reasons for selecting these particular classes. The 20 to 25 year age group numbered 27 per cent of the sample, the 26 to 30 group 32 per cent, and the 31 to 55 group 41 per cent. It was noted that 59 per cent of the sample was under 30 years of age indicating a young work force. The distributions of the ages of both subsamples were approximately equal to one another and to the sample. This illustrated that the young age of the work force was most likely not associated with sex though it was not statistically tested.

The distribution of medical technologists and medical laboratory technicians in the sample was disproportional with the former greatly outnumbering the latter. There were 115 medical technologists and 26 medical laboratory technicians which is approximately 82 and 18 per cent respectively. The uneven distribution may be partially due to the presence of active medical technology schools in all three hospitals. Presumably, graduating students would be encouraged to become employees of the hospital in which they received their training in order to

FIGURE 1

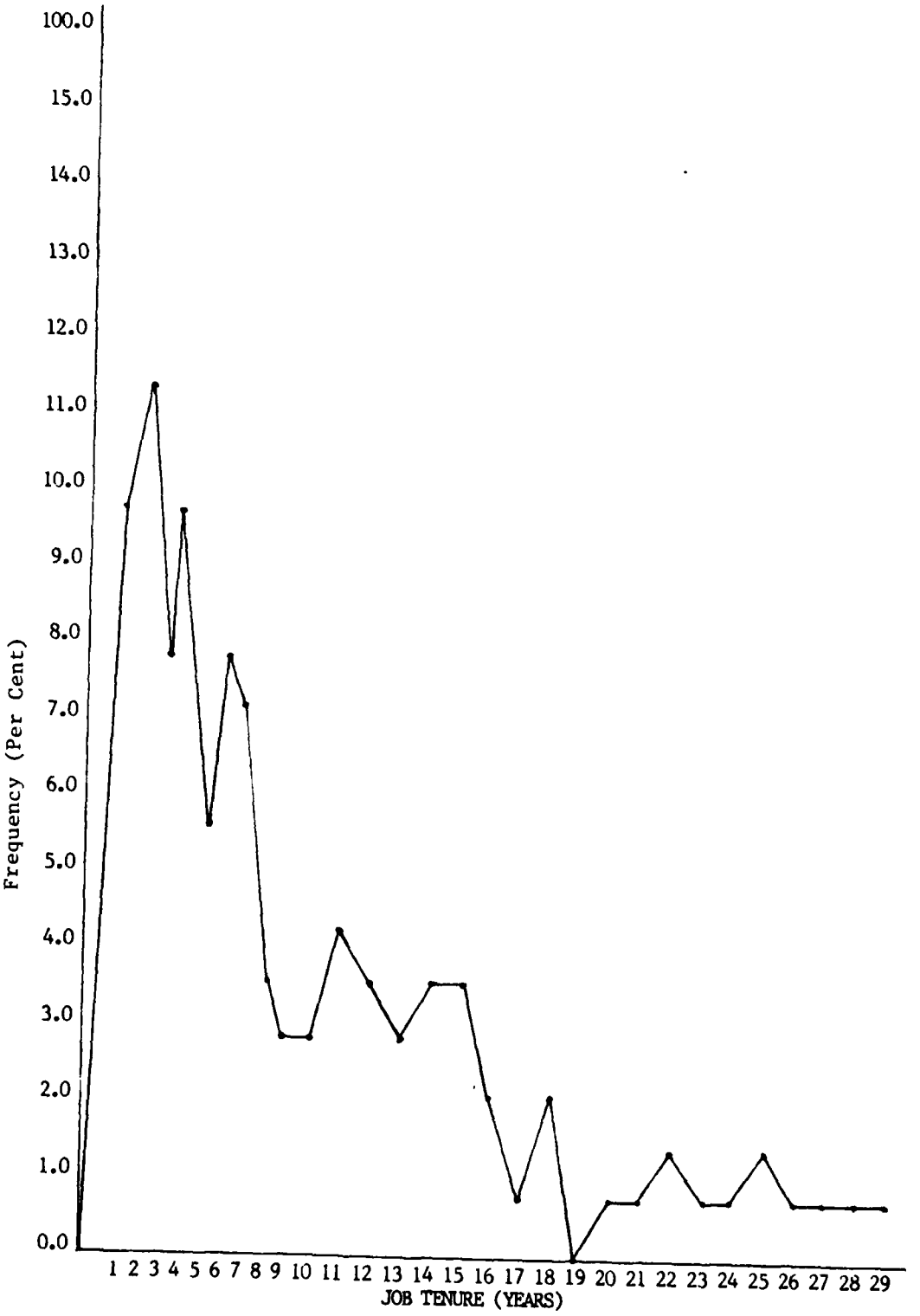
100.0
15.0
14.0
13.0
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
Frequency (Per Cent)
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29
JOB TENURE (YEARS)

TABLE 2. GROUP CHARACTERISTICS OF SAMPLE AND SUBSAMPLES

CHARACTERISTIC	SAMPLE		SUBSAMPLE MALE		SUBSAMPLE FEMALE	
	N	%	N	%	N	%
AGE						
20-25	38	27.0	5	27.8	33	26.8
26-30	45	31.9	6	33.3	39	31.7
31-55	58	41.1	7	38.8	51	41.5
CLASS						
MT	115	81.6	17	94.4	98	79.7
MLT	26	18.4	1	5.6	25	20.3
CURSPEC						
Chem-Urin	39	27.7	7	38.9	32	26.0
Hem-Coag	36	25.5	2	11.1	34	27.6
BB-Immun	33	23.4	5	27.8	28	22.8
Micro	33	23.4	4	22.2	29	23.6
PRESPEC						
Chem-Urin	28	19.9	5	27.8	23	18.7
Hem-Coag	38	27.0	2	11.1	36	29.8
BB-Immun	30	21.3	5	27.8	25	20.3
Micro	45	31.9	6	33.3	39	31.7
FAC						
BMH	64	45.4	6	33.3	58	47.2
MHMC	45	81.9	4	22.2	41	33.3
MBMC	32	22.7	8	44.4	34	27.6
DIFF						
YES	24	17.0	4	22.2	20	16.3
NO	117	83.0	14	77.8	103	83.7
TOTAL	141		18		123	

compensate for the costs of the schools. In addition, the students may wish to be employed by an organization with which they are familiar. Classification distributions among the male subsample were more asymmetrical than the sample or the female subsample. Of the males, 94 per cent were medical technologists and 6 per cent were medical laboratory technicians. Among females, roughly 80 per cent were medical technologists and 20 per cent medical laboratory technicians.

Each specialty in which the subjects' were currently working accounted for approximately one quarter of the sample. The chemistry-urinalysis department contained 28 per cent of the sample, hematology-coagulation 26 per cent, and both blood bank-immunology and microbiology 23 per cent. When placement in a specialty was based on preference of the subject rather than where he was currently working, the distribution changed considerably for two specialties. Chemistry-urinalysis dropped from 28 to 20 per cent while the percentage in microbiology increased 23 to 32. The percentages in blook bank-immunology and hematology remained relatively the same. Microbiology was the most pereferred specialty and hematology the next. For the female subsample, the distributions among the current and preferred specialties were nearly identical to those of the sample. However, the males had a unique distribution in both categories. A much greater proportion of males worked in chemistry-urinalysis, 39 per cent, and a lesser one in hematology-coagulation, 11 per cent, than for the sample or the female subsample. A statistical test of this association was not possible because of the small number of males. The shift in distributions from current to preferred specialty for males occured in the same manner as for the sample and the females, but the magnitudes of the decreases in chemistry-urinalysis and the

increase in microbiology were much greater. The number of males in the former department dropped 11 per cent while the number in the latter department rose 11 per cent. It was not a one to one exchange. This implies that a sex related personality trait may be responsible for this phenomena.

Neither the sample nor the subsamples were evenly distributed among the three hospitals. BMH accounted for 45 per cent of the subjects, MHMC for 32 per cent, and MBMC for 23 percent. The female subsample was roughly equivalent to this, but in the case of the males, MBMC had proportionately more, 44 per cent, than the other two hospitals. This is suggestive as it is the smallest of the three. It either implies a greater proportional number of males at MBMC or more males that were willing to take the test. Regardless, it may become significant in interpreting the results if a sex related personality trait is associated with choice of specialty or job tenure.

In the sample, only 17 per cent indicated a desire to change specialties. Among the females, 16 per cent indicated a desire to change, but among males, 22 per cent expressed this desire.

Figure 1 shows the histogram of job tenure for the sample. Approximately 60 per cent of the sample had 7 years or less work experience. This corresponds to 59 per cent of the sample being 31 years or younger. A slight peak was noted in the 11 to 15 year range as well, accounting for approximately 17 per cent of the sample. From Table 3 it can be seen that the same job tenure for the sample was 8.2 years. For the males it was 7.0 years and for the females 8.4 years. A t-test revealed that there was no significant difference between the means.

TABLE 3. MEANS, STANDARD DEVIATIONS, AND SIGNIFICANCE TESTS FOR DIFFERENCES BETWEEN MEAN JOB TENURE OR SUBSAMPLES

	Sample	Subsample		
		Male	Female	t
N	141	18	123	
Mean	8.2	7.0	8.4	0.83
(S.D.)	(6.7)	(5.7)	(6.9)	

Overall, the sample consisted mainly of female medical technologists under 31 years of age with a mean job tenure of 8.4 years. The females were evenly distributed among the four specialties, but many expressed a propensity to shift from chemistry-urinalysis into, primarily, microbiology. The majority wished to remain where they were. A minority of the sample consisted of male medical technologists under 31 years of age with a mean job tenure of 7.0 years. Proportionally more males were found in chemistry-urinalysis and fewer in hematology-coagulation than females. The males demonstrated the same directional shift as the females, but did so in a greater magnitude.

Indices

Sample

The distribution of the dichotomous personality indices for the sample closely resembled those of Bowling (1973), French and Rezler (1976) Williams (1975) and Williams (1976). The findings of this study and those mentioned are summarized in Table 4. The only significant difference lies in the EI distribution of Bowling's study, but her results do not agree with the majority and may be due to sample differences unaccounted for. In this study, Extroverts constituted 38 per cent of the sample, introverts 62 per cent, sensing 73 per cent, intuitive 27 per cent, thinking 43 per cent, feeling 57 per cent, judging 78 per cent, and perceiving 22 per cent. The SJ combination with 60 per cent of the sample was the most prevalent preference. Thinking and feeling preferences were distributed almost evenly.

Table 5 shows the results of the breakdown and tests of independence for each index by the sample characteristics, current and preferred specialty, and DIFF. There were few significant associations. Sex was related to the TF index, as expected, with a chi square of 7.43 significant at the 0.01 level. The SN index was associated with facility with a chi square of 9.15 significant at the 0.01 level. Finally, and most importantly to the purpose of this study, the JP index was associated with the current specialty of the subject with a chi square of 12.53 significant at the 0.01 level.

It was already noted that the TF index was expected to be dependent on sex. For this study, asymmetric lambda was 0.133 with TF dependent on sex. Lambda has a proportional reduction in error (PRE) interpretation, (Leonard, 1976; Agresti, 1979), therefore, in this case,

TABLE 4. SUMMARY OF INDICES AND TYPE DISTRIBUTORS FROM PREVIOUS STUDIES AND THE PRESENT STUDY

INDICES IN %	STUDY+ Bowling 1973	Williams 1975	French-Rezler 1976	Williams 1976	Present Study
E	60.7	43.9	39	36.9	38.3
I	39.3	56.1	61	63.1	61.7
S	73.2	62.2	77	62.1	73.0
N	26.8	37.8	23	37.9	27.0
T	48.2	49.3	55	36.3	42.6
F	51.8	50.7	45	63.7	57.4
J	75.0	65.5	71	66.0	78.0
P	25.0	34.5	29	34.0	22.0
TYPE IN %					
ENFJ	5.3	2.7	4	5.6	4.3
ENFP	1.8	6.1	4	4.9	1.4
ENTJ	7.1	8.0	2	2.9	3.5
ENTP	1.8	2.0	...	2.6	2.1
ESFJ	10.7	7.4	7	8.5	8.5
ESFP	8.9	3.4	2	4.6	3.5
ESTJ	21.4	10.8	21	5.9	14.2
ESTP	3.6	3.4	...	2.0	0.7
INFJ	3.6	3.4	...	7.5	5.7
INFP	3.6	6.8	5	7.5	4.3
INTJ	1.8	4.7	7	2.9	5.0
INTP	1.8	4.1	2	3.9	0.7
ISFJ	14.3	14.9	10	19.3	24.1
ISFP	3.6	6.1	12	5.9	5.7
ISTJ	10.7	13.5	20	13.4	12.8
ISTP	...	2.7	4	2.6	3.5
TOTAL	100.0	100.0	100	100.0	100.0
N	56	148	56	306	141

Source: Adapted from M. R. Williams (1976)

+All but Present Study included only medical technologists; French and Rezler (1976) and Williams (1976) excluded males from their sample.

TABLE 5. BREAKDOWN OF INDICES BY SAMPLE CHARACTERISTICS, CURRENT AND PREFERRED SPECIALTIES, AND DIFF

VARIABLE	EXTROVERT N	EXTROVERT %	INTROVERT N	INTROVERT %	CHI SQUARE	SENSING N	SENSING %	INTUITIVE N	INTUITIVE %	CHI SQUARE
SEX										
Male	9	6.4	9	6.4	1.96	14	9.9	4	2.8	0.234
Female	45	31.9	78	55.3		89	63.1	34	24.1	
AGE										
20-25	18	12.8	20	14.2	4.86	30	21.3	8	5.7	0.921
26-30	20	14.2	25	17.7		32	27.7	13	9.2	
31-55	16	11.3	42	29.8		41	29.1	17	12.1	
CLASS										
MT	44	31.2	71	50.4	0.00	82	58.2	33	23.4	0.965
MLT	10	7.1	16	11.3		21	14.9	5	3.5	
CURSPEC										
Chem-Urin	12	8.5	27	19.1	2.44	29	20.6	10	7.1	0.396
Hem-Coag	14	9.9	22	15.6		25	17.7	11	7.8	
BB-Immun	16	11.3	17	12.1		25	17.7	8	5.7	
Micro	12	8.5	21	14.9		24	17.0	9	6.4	
PRESPEC										
Chem-Urin	10	7.1	18	12.8	0.143	21	14.9	7	5.0	0.669
Hem-Coag	15	10.6	23	16.3		26	18.4	12	8.5	
BB-Immun	12	8.5	18	12.8		23	16.3	7	5.0	
Micro	17	12.1	28	19.9		33	23.4	12	8.5	
FAC										
BMH	27	19.1	37	26.2	0.761	42	29.8	22	15.6	9.15**
MHMC	16	11.3	29	20.6		31	22.0	14	9.9	
MBMC	11	7.8	21	14.9		30	21.3	2	1.4	
DIFF										
Yes	11	7.8	13	9.2	0.691	19	13.5	5	3.5	0.550
No	43	30.5	74	52.5		84	59.6	33	23.4	

**$p < 0.01$

TABLE 5. (Continued)

VARIABLE	THINKING N	%	FEELING N	%	CHI SQUARE	JUDGING N	%	PERCEIVING N	%	CHI SQUARE
SEX										
Male	13	9.2	5	3.5	7.43**	13	9.2	5	3.5	0.404
Female	47	33.3	76	53.9		97	68.8	26	18.4	
AGE										
20-25	16	11.3	22	15.6		28	19.9	10	7.1	
26-30	16	11.3	29	20.6	1.68	33	23.4	12	8.5	2.41
31-55	28	19.9	30	21.3		49	34.8	9	6.4	
CLASS										
MT	52	36.9	63	44.7	1.81	89	63.1	26	18.4	0.141
MLT	8	5.7	18	12.8		21	14.9	5	3.5	
CURSPEC										
Chem-Urin	17	12.1	22	15.6		34	24.1	5	3.5	
Hem-Coag	14	9.9	22	15.6	1.82	32	22.7	4	2.8	12.53**
BB-Immun	12	8.5	21	14.9		25	17.7	8	5.7	
Micro	17	12.1	16	11.3		19	13.5	14	9.9	
PRESPEC										
Chem-Urin	12	8.5	16	11.3		24	17.0	4	2.8	
Hem-Coag	14	9.9	24	17.0	2.28	34	24.1	4	2.8	7.19
BB-Immun	11	7.8	19	13.5		21	14.9	9	6.4	
Micro	23	16.3	22	15.6		31	22.0	14	9.9	
FAC										
BMH	4	17.0	40	28.4		50	35.5	14	9.9	
MHMC	3	16.3	22	15.6	2.07	32	22.7	13	9.2	2.93
MBMC	3	9.2	19	13.5		28	19.9	4	2.8	
DIFF										
Yes	11	7.8	13	9.2	0.127	19	13.5	5	3.5	0.022
No	49	34.9	68	48.2		91	64.5	26	18.4	

**$p < 0.01$

it can be inferred that a knowledge of the subject's sex would cause a 13.3 per cent reduction in error when predicting whether the subject preferred thinking or feeling on the average. The significance of this relationship led to a one tailed t-test between the male and female thinking and feeling scores to determine whether the effect was due to the strength of the preference or the qualitative nature of the trait alone. These results are summarized in Table 6. The mean thinking score of 31.2 for the males was significantly greater than the mean thinking score of 19.6 for the females at the 0.05 level. The mean feeling score of males, 13.8 and the mean for females, 16.9, were not significantly different.

TABLE 6. MEANS, STANDARD DEVIATIONS, AND ONE-TAILED T-TEST BETWEEN THINKING AND FEELING SCORES OF MALES AND FEMALES

Index		Male	Female	t
Thinking Score	N	13	47	1.87*
	Mean	31.2	19.6	
	(S.D.)	(21.6)	(11.7)	
Feeling Score	N	5	76	0.84
	Mean	13.8	16.9	
	(S.D.)	(7.8)	(10.9)	

* $p < 0.05$

The association between the SN index and facility was not expected. Lambda took on a numerical value of zero in this case because of the large differences in the marginal totals (Blalock, 1979). For this reason, a coefficient of uncertainty was calculated to interpret the strength of the association (Theil, 1967; Theil, 1972; Nie et al., 1975). This test is interpreted similarly to the lambda, but does not represent PRE. It denotes the decrease in uncertainty regarding information that will be received which is in this case the knowledge of which facility the person will be attracted to because of perceived characteristics compatible with this portion of his personality. The uncertainty coefficient for the SN/facility relationship was 0.038, indicating that a knowledge of an individual's SN preference will reduce the uncertainty in predicting which hospital he is likely to be found by 3.8 per cent. This is a very weak association and is of no practical value. For this reason, the relationship will be disregarded in this study (Gold, 1969).

The Association between the JP index had an asymmetric lambda of 0.088 with current specialty dependent on the index. This is a fairly weak association as well, but as will be seen in the discussion, there are some highly probable explanations for the diminished strength of this relationship which might justify its continued practical acceptance. The results show that judging types tended to be located in chemistry-urinalysis and hematology-coagulation. Perceiving types were found primarily in blood bank-immunology and microbiology. Table 7 shows the mean judging and perceiving scores for each specialty. A one-way analysis of variance indicated that there were no significant differences between the scores. This indicates that what dependency

exists for specialty choice on the JP index is due to the qualitative nature of the trait and not upon the strength of it.

TABLE 7. MEANS, STANDARD DEVIATIONS, AND SIGNIFICANCE TESTS BETWEEN JUDGING AND PERCEIVING SCORES OF CURRENT SPECIALTIES FOR SAMPLE

Index		Chem-Urin	Hem-Coag	BB-Immun	Micro	F
Judging Score	N	34	32	25	19	
	Mean	25.2	31.4	25.2	27.8	1.57
	(S.D.)	(14.1)	(11.8)	(13.3)	(13.1)	
Perceiving Score	N	55	4	8	14	
	Mean	39.0	28.0	28.5	17.0	2.37
	(S.D.)	(15.8)	(10.1)	(14.00)	(19.5)	

Job experience was the last sample characteristic to be compared with the indices. Correlation coefficients and coefficients of determination are shown in Table 8. The SN and JP indices were sigificantly correlated with job tenure at the 0.05 level, and the EI index at 0.01 level. The EI index accounted for 4.8 percent of the variation in job tenure, SN index 2.4 percent, and JP index 1.9 percent. T-tests between mean job tenure in years

TABLE 8. CORRELATIONS BETWEEN JOB TENURE AND CONTINUOUS SCORES OF SAMPLE INDICES

Sample	EI	SN	TF	JP
r	0.22**	-0.16*	-0.09	-0.14*
r^2	0.048	0.024	0.009	0.019

*$p < 0.05$ **$p < 0.01$

for the dichotomies of each index are summarized in Table 9. Only one significant difference at the 0.05 level emerged. Introverts with a mean experience of 9.0 years stayed on the job longer than the extroverts with a mean tenure of 6.9 years. The judging preference, though not significant, did show a higher mean tenure than those who prefer the perceiving index.

TABLE 9. MEANS, STANDARD DEVIATIONS, AND SIGNIFICANCE TESTS FOR DIFFERENCES BETWEEN MEAN JOB TENURE OF INDICES

Extrovert			Introvert			t
N	Mean	(S.D.)	N	Mean	(S.D.)	
54	6.9	(6.3)	87	9.0	(6.9)	1.80*

Sensing			Intuitive			t
N	Mean	(S.D.)	N	Mean	(S.D.)	
103	7.3	(5.2)	38	8.6	(7.3)	0.98

Thinking			Feeling			t^+
N	Mean	(S.D.)	N	Mean	(S.D.)	
60	7.8	(6.4)	81	8.8	(7.2)	0.85

Judging			Perceiving			t
N	Mean	(S.D.)	N	Mean	(S.D.)	
110	8.6	(7.0)	31	6.8	(5.5)	1.30

\+ Two-tailed test, all others are one-tailed.

* $p < 0.05$

Subsamples

The subsamples were examined in the same manner as the sample; however, due to the small number of males, chi square could not be used to test for associations with the indices. The breakdown of the male subsample indices by the demographic variables, current and preferred specialties, and DIFF are summarized in Table 11. Table 10 shows the correlation coefficients and coefficients of determination for job tenure of the subsamples and the continuous scores of the indices. The SN and JP indices approached significance in the expected direction for the males. Small sample size is the cause for the lack of significance. Within the female subsample, two indices were found to be significantly correlated: The EI index at the 0.01 level, and the SN index at the 0.05 level. The JP index approached significance with a p-value of 0.09. The degree of association was similar to that of the sample however.

TABLE 10. CORRELATIONS BETWEEN JOB TENURE AND CONTINUOUS SCORES OF SUBSAMPLE INDICES

		EI	SN	TF	JP
Males	r	-0.05	-0.27	-0.12	-0.26
	r^2	0.00	0.07	0.013	0.065
Females	r	0.25**	-0.15*	-0.12	-0.12
	r^2	0.064	0.022	0.015	0.015

*$p < 0.05$ **$p < 0.01$

TABLE 11. BREAKDOWN OF INDICES BY MALE SUBSAMPLE CHARACTERISTICS, CURRENT AND PREFERRED SPECIALTY, AND DIFF

VARIABLE	EXTROVERT		INTROVERT		SENSING		INTUITIVE		THINKING		FEELING		JUDGING		PERCEIVING	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
AGE																
20-25	3	16.7	2	11.1	4	22.2	1	5.6	3	16.7	2	11.1	3	16.7	2	11.1
26-30	4	22.2	2	11.1	4	22.2	2	11.1	3	16.7	3	16.7	3	16.7	3	16.7
31-55	2	11.1	5	27.8	6	33.3	1	5.6	7	38.9	0	0.00	7	38.9	0	0.00
CLASS																
MT	8	44.4	9	50.0	13	72.2	4	22.2	2	66.7	5	27.8	12	66.7	5	27.8
MLT	1	5.6	0	0.00	1	5.6	0	0.00	1	5.6	0	0.00	1	5.6	0	0.00
CURSPEC																
Chem-Urin	4	22.2	3	16.7	4	22.2	3	16.7	4	22.2	3	16.7	5	27.8	2	11.1
Hem-Coag	1	5.6	1	5.6	2	11.1	0	0.00	1	5.6	1	5.6	1	5.6	1	5.6
BB-Immun	3	16.7	2	11.1	5	27.8	0	0.0	4	22.2	1	5.6	5	27.8	0	0.00
Micro	1	5.6	3	16.7	3	16.7	1	5.6	4	22.2	0	0.0	2	11.1	2	11.1
PRESPEC																
Chem-Urin	3	16.7	2	11.1	3	16.7	2	11.1	3	16.7	2	11.1	3	16.7	2	11.1
Hem-Coag	1	5.6	1	5.6	2	11.1	0	0.00	1	5.6	1	5.6	2	11.1	0	0.00
BB-Immun	2	11.1	3	16.7	4	22.2	1	5.6	4	22.2	1	5.6	5	27.8	0	0.00
Micro	3	16.7	3	16.7	5	27.8	1	5.6	5	27.8	1	5.6	3	16.7	3	16.7
FAC																
BMH	4	22.2	2	11.1	5	27.8	1	5.6	5	27.8	1	5.6	4	22.2	2	11.1
MHMC	1	5.6	3	16.7	1	5.6	3	16.7	3	16.7	1	5.6	2	11.1	2	11.1
MBMC	4	22.2	4	22.2	8	44.4	0	0.00	5	27.8	3	16.7	7	38.9	1	5.6
DIFF																
Yes	3	16.7	1	5.6	3	16.7	1	5.6	2	11.1	2	11.1	3	16.7	1	5.6
No	6	33.3	8	44.4	11	61.1	3	16.7	11	61.1	3	16.7	10	55.6	4	22.2

The breakdown and tests of independence for the female subsample are summarized in Table 12. As with the sample, current specialty was dependent on the JP index with a chi square of 13.81 significant at the 0.01 level. Perceiving types tended to gravitate towards blood bank-immunology and microbiology. Judging types were found more often in chemistry-urinalysis and hematology-coagulation. Asymmetric lambda was 0.101 which is slightly better than the sample's lambda of 0.088. One-way analysis of variance (Table 13) demonstrated no significant difference between the mean preference scores indicating the effect is not due to the strength of the index.

The preferred specialty was dependent on the JP index as well. The chi square was 8.79 significant at the 0.05 level. Asymmetric lambda with preferred specialty dependent on the JP index was 0.048. No significant differences were noted in a one-way analysis of variance (Table 14).

Facility was associated with the SN index as it was in the sample. Chi square was 6.61 significant at the 0.05 level. Asymmetric lambda was zero in this case for the same reasons as the sample, therefore, the uncertainty coefficient was calculated. This value was 0.030 which is even weaker than that of the sample. For the same reason, this relationship will no longer be considered for this study.

To summarize, the males in the sample tended to prefer the thinking index more than the females and the females preferred the feeling trait more often. Males were more strongly thinking types than thinking females, but there was no difference between the strengths of feeling preferences of males and females. Within the sample and the female subsample, those who preferred the judging index had a propensity to be

TABLE 12. BREAKDOWN OF INDICES BY FEMALE SUBSAMPLE CHARACTERISTICS, CURRENT AND PREFERRED SPECIALTIES, AND DIFF

VARIABLES	EXTROVERT N	EXTROVERT %	INTROVERT N	INTROVERT %	CHI SQUARE	SENSING N	SENSING %	INTUITIVE N	INTUITIVE %	CHI SQUARE
AGE										
20-25	15	12.2	18	14.6		26	21.1	7	5.7	
26-30	16	13.0	23	18.7	3.28	28	22.8	11	8.9	1.04
31-55	14	11.4	37	30.1		35	28.5	16	13.0	
CLASS										
MT	36	29.3	62	50.4	0.005	69	56.1	29	23.6	0.916
MLT	9	7.3	16	13.0		20	16.3	5	4.1	
CURSPEC										
Chem-Urin	8	6.5	24	19.5		25	20.3	7	5.7	
Hem-Coag	13	10.6	21	17.1	3.08	23	18.7	11	8.9	0.922
BB-Immun	13	10.6	15	12.2		20	16.3	8	6.5	
Micro	11	8.9	18	14.6		21	17.1	8	6.5	
PRESPEC										
Chem-Urin	7	5.7	16	13.0		18	14.6	5	4.1	
Hem-Coag	14	11.4	22	17.9	0.591	24	19.5	12	9.8	1.16
BB-Immun	10	8.1	15	12.2		19	15.4	6	4.9	
Micro	14	11.4	25	20.3		28	20.8	11	8.9	
FAC										
BMH	23	18.7	35	28.5		37	30.1	21	17.1	
MHMC	15	12.2	26	21.1	0.805	30	24.4	11	8.9	6.61*
MBMC	7	5.7	17	13.8		22	17.9	2	1.6	
DIFF										
Yes	8	6.5	12	9.8	0.120	16	13.0	4	3.3	0.697
No	37	30.1	66	53.7		73	59.3	30	24.4	

*$p < 0.05$

TABLE 12. (Continued)

VARIABLES	THINKING N	%	FEELING N	%	CHI SQUARE	JUDGING N	%	PERCEIVING N	%	CHI SQUARE
AGE										
20-25	13	10.6	20	16.3		25	20.3	8	6.5	
26-30	13	10.6	26	21.1	0.603	30	24.4	9	7.3	0.652
31-55	21	17.1	30	24.4		42	34.1	9	7.3	
CLASS										
MT	40	32.5	58	47.2	1.39	77	62.6	21	17.1	0.024
MLT	7	5.7	18	14.6		20	16.3	5	4.1	
CURSPEC										
Chem-Urin	13	10.6	19	15.4		29	23.0	3	2.4	
Hem-Coag	13	10.6	21	17.1	3.08	31	25.2	3	2.4	13.81**
BB-Immun	8	6.5	20	16.3		20	16.3	8	6.5	
Micro	13	10.6	16	13.0		17	13.8	12	9.8	
PRESPEC										
Chem-Urin	9	7.3	14	11.4		21	17.1	2	1.6	
Hem-Coag	13	10.6	23	18.7	2.22	32	26.0	4	3.3	8.79*
BB-Immun	7	5.7	18	14.6		16	13.0	9	7.3	
Micro	18	14.6	21	17.1		28	22.8	11	8.9	
FAC										
BMH	19	15.4	39	31.7		46	37.4	12	9.8	
MHMC	20	16.3	21	17.1	2.91	30	24.4	11	8.9	1.88
MBMC	8	6.5	16	13.0		21	17.1	3	2.4	
DIFF										
Yes	9	7.3	11	8.9	0.467	16	13.0	4	3.3	0.019
No	38	30.9	65	52.8		81	65.9	22	17.9	

*$p < 0.05$ **$p < 0.01$

TABLE 13. MEANS, STANDARD DEVIATIONS, AND SIGNIFICANCE TESTS BETWEEN FEMALE JUDGING AND PERCEIVING SCORES OF CURRENT SPECIALTIES

Index		Chem-Urin	Hem-Coag	BB-Immun	Micro	F
Judging Score	N	29	31	20	17	
	Mean	25.6	31.1	25.7	27.8	1.08
	(S.D.)	(14.4)	(11.9)	(13.7)	(13.7)	
Perceiving Score	N	3	3	8	12	
	Mean	46.3	29.0	28.5	19.2	2.21
	(S.D.)	(3.1)	(12.2)	(14.1)	(20.3)	

TABLE 14. MEANS, STANDARD DEVIATIONS, AND SIGNIFICANCE TESTS BETWEEN FEMALE JUDGING AND PERCEIVING SCORES OF PREFERRED SPECIALTIES

Index		Chem-Urin	Hem-Coag	BB-Immun	Micro	F
Judging Score	N	21	32	16	28	
	Mean	26.5	30.4	25.6	26.9	0.631
	(S.D.)	(13.3)	(12.2)	(14.2)	(14.5)	
Perceiving Score	N	2	4	9	11	
	Mean	48.0	32.0	27.0	19.7	1.73
	(S.D.)	(1.4)	(20.9)	(13.9)	(19.2)	

in either chemistry-urinalysis or hematology-coagulation. Those who preferred the perceiving index were most often located in blood bank-immunology or microbiology specialties. The associations are not very strong, yet there is evidence which will be discussed in the next section that supports a further examination of these associations before they are disregarded. Job tenure was weakly correlated with the EI, SN indices for the females. The directions of the correlations indicated that the laboratory workers whose personality traits included the introverted, sensing, and judging indices will have a longer job tenure than those who are not. The correlations among males failed to reach significance due to small sample size, but appeared to simulate the results found in the sample and the female subsample.

Type

Because of the small number of subjects found in some of the categories, no statistical evaluation of the type was attempted. The frequencies are summarized in Table 4. The studies, including this one, concur with one another fairly well taking into consideration the difference in their sample characteristics. For this study, the most common types were ISFJ (24.1 per cent), ESTJ (14.2 per cent), ISTJ (12.8 per cent) and ESFJ (8.5 per cent). These 4 types out of the 16 possible ones accounted for 60 per cent of the sample.

Summary

The sample consisted primarily of female medical technologists under 31 years of age with a mean job experience of 8.4 years. Most of the subjects preferred to remain in the specialty in which they were currently working. Tests of independence revealed a weak dependency of current specialty on the JP index for the sample and the female subsample. There was also a weak correlation between job tenure of a subject and whether he preferred the introvert, sensing, and judging indices. The inverse was true for those who preferred the extrovert, intuitive, and perceptive indices. The sex related TF index had no effect on either specialty or job tenure. The most frequently encountered types were ISFJ, ESTJ, ISTJ and ESFJ in descending order of occurrence.

DISCUSSION

Summary of Results

The results indicated that this sample of laboratory workers possessed for the most part a set of personality traits usual for the profession. The characteristics of the four types ISFJ, ESTJ, ISTJ, and ESFJ can be summarized as dependable, practical, realistic, preferring to work with details in an orderly and prescribed manner, adaptable to routine, and desiring to maintain some degree of control over their environment. These types confirm the results of previous studies cited earlier and support the theory that persons in the occupation possess traits which correspond with the behavioral requirements of the work environment.

It was surmised that the effects of these personality characteristics would extend to selection of a task environment within the occupation and that the criteria may possibly hinge on the environment's degree of task structure. This turned out to be true. The JP index was associated with the specialty in which a person worked. Judging types prefer more organization and order in their work environment and are less tolerant of ambiguity and change. On the other hand, perceiving types are more adaptable and flexible tolerating ambiguity and change to a greater extent. The results demonstrated that laboratory workers who preferred judging tended to be located in the more structured specialties, that is chemistry-urinalysis and hematology-coagulation. Perceiving types were found more often in the less structured departments such as blood bank-immunology and microbiology. One would expect from the theory that the strength of a

preference would also relate to the degree of task structure; however, this did not occur. The data indicated that no differences existed between the scores of judging and perceiving types among specialties. Therefore, for this study, one must conclude that the effect of the JP index is limited to the qualitative traits of the factor alone and is not affected by it's perceived strength.

None of the other indices had any significant impact on specialty choice. One may conclude that none of the demographic variables did either because of the absence of any significant relationships with the JP index. Controlling for sex enhanced the association slightly, but to no practical degree. The selection of a task environment then may be considered to be to some extent a result of the individual's desire to find a setting that is perceived as having a task structure that is compatible with his desire for orderliness and tolerance of ambiguity.

There are a number of possible reasons why personality played a small role in this choice. One possibility considered and controlled for in this study was whether the individual has a choice in selection of a specialty or whether he was placed in whatever department had a vacancy at the time of employment. The results indicated that the majority of the workers were currently in the specialty they wished to be and would not prefer to work in another. An analysis, not shown in the results, indicated that workers with seven years or less of tenure more frequently expressed a desire to transfer than those with more than seven years; even so, they were still in the minority. This suggests that most workers are able to enter the specialty they desire at some point of their career and those who do not frequently resign themselves to whatever specialty they are in after committing a number of years to

it. Since laboratory workers shun uncertainty and extol competence and expertise, this finding is not surprising. Once an employee has developed a level of expertise in a specialty, it is unlikely that he would risk the feelings of uncertainty and ambiguity associated with being a novice in a new department just to gain some degree of task structure. The perceived benefits do not outweigh the costs.

Another possibility to consider is to what extent the departments actually differ in their task structure. They were presumed to differ in this study, but no measurements were accomplished.

Two other potential causes related to the environment of the specialties are the perceived status of the department and the physical surroundings. Blood bank, immunology, and microbiology because of their lack of automation are perceived as requiring more personal competence and expertise to perform the tasks. Automation is seen by members of this occupation as limiting the professional application of skills and abilities and reducing the job to a simple production assembly line. Because of laboratory workers' emphasis on personal competence, chemistry-urinalysis and hematology are seen as low status, less professional tasks than the other specialties and possibly as constraining promotion opportunities. The physical surroundings played a key role in specialty choice as well. In one particular hospital, it was noted that nearly one-half of those in the chemistry department and over 20 per cent of those in hematology-coagulation who participated in the study wished to leave their current specialty. Of these, 85 and 100 per cent, respectively, wanted to transfer to microbiology. Noticeably, the majority of these persons were judging types who were expressing a desire to move into a more unstructured task environment. This pattern

was unique to this one hospital. An interesting feature of the three departments involved was the difference in their physical work settings. Chemistry and hematology were long, rectangular rooms. Chemistry was crowded and arranged such that the workers were isolated from one another. Hematology was less crowded and more open, but the workers appeared to be spaced far apart. Microbiology, in contrast to both of these departments, was a square, open room with circular work benches. The workers could communicate freely with one another. The immediate impression one received when entering chemistry was oppressive. In hematology, the atmosphere was more relaxed but remote. However, upon entering microbiology one felt immediately a mood of warmth and sociableness. Hall (1966) delivers an excellent discussion of the effects of physical features of an environment on the psychological and physiological elements of humans. Hall states that conditions similar to those described in the chemistry and hematology departments of this hospital could produce dysfunctional outcomes, whereas, those like the microbiology specialty could produce favorable ones unless other factors such as supervisory support are able to obscure their effects. This is not to say that the physical features of the environment were the only causes of this desire to transfer to microbiology, particularly when one considers the perceived social status of the departments. It does suggest, however, that it may have had a strong influence in this case.

Interpersonal relationships cannot be excluded as possible causes of an individual's specialty choice. Any number of reasons under this heading would dilute the influence of personality on either job tenure or specialty choice.

The last possible reason for the weak relationship is the proportion of judging to perceiving types. The former outnumbered the latter in the sample by almost four to one. This imbalance would explain the large number of judging types found in the blood bank, immunology, and microbiology specialties. Since the occupation is overall a highly structured one, persons of this preference are attracted to it, but once in the profession, because of the sheer numbers and the factors cited above, many find themselves in the less structured specialties.

Because the weak relationships between the JP index and specialty choice can be explained by these factors it is not disregarded as having no practical implications. Yet it does imply the need for additional studies controlling for these factors.

The results supported the hypotheses regarding job tenure and personality, however, the simple correlations were rather weak. Persons who were either introverts, sensing, or judging had greater job tenure than those who were extroverts, intuitives, or perceiving. In addition to an incompatibility of the latter individual's personality traits with the work environment, DeFiore et al., (1981) indicated that these more outgoing and flexible people were willing to tolerate the uncertainty of leaving one job and finding another. A primary potential cause for the weak relationships is that separately the personality traits could not account for enough of the variance when competing with the numerous other factors such as job markets, reluctance to relocate, compensation, and family influences. Jaccard (1981) developed and validified a multiple regression model that utilized an individual's attitudes towards performing a behavior as predictor variables and intention to perform the behavior as the dependent variable. He defined attitudes in

a manner similar to the definition of personality traits. Mowday and Spencer (1981) developed a multiple regression model to predict turnover rates. The predictor variables included task characteristics measured by Hackman and Oldham's (1975) Job Diagnostic Survey, personality traits which only included need for autonomy and achievement, a covariance term, and a quadratic task characteristics term. Both studies were successful in predicting their appropriate dependent variable, but Mowday and Spencer obtained weak magnitudes of correlation. This does not imply that the model is not useful, but that their measures of either personality or task characteristics were inadequate. On the basis of the findings of this study, their measure of personality is implicated.

That a relationship was found between the introvert, sensing, and judging personality traits and job tenure supports the theory that persons of this type are more likely to be satisfied in a laboratory work environment because of a congruent match in characteristics. There is an implication, however, that the traits may interact with one another and with the work environment to influence an individual's decision to remain in the profession.

Limitations

There are several limitations which must be applied to the inferences contained within this study. The first is the small number of males and particularly male medical laboratory technicians in the sample. Though neither sex nor classification were seen to have any significant effect on specialty choice or job tenure, for the sample or the female subsample, one cannot ignore the fact that no statistical

Another limitation is that only three hospitals were surveyed. Though this variable impacted on only the SN index and very weakly, it is hard to determine what unaccounted influences attributable to the hospital may have affected either specialty choice or job tenure. A good example of this is the effect that the physical surroundings probably had in one hospital on the worker's desire to change specialties.

The sample size preventing statistical tests for associations between the 16 types and the other variables was an additional limitation. Failure to do so frustrates attempts to perform a more individualized examination of the personality and work characteristics interaction. Though comparing the indices and specialties provides a general support of the theory, a practical clustering of types among the specialties would allow a direct application to each individual case with which a manager may be confronted.

The final limitation to be mentioned is the fact that the MBTI is a self-reporting personality test with all the inherent difficulties of its kind. The results obtained by the MBTI are subject to error arising from several sources. One may be the test itself. Though the most current and valid form was utilized, one cannot assume that it is statically relevant in a dynamic society whose norms and attitudes are in a state of continuous change. Second, is the individual taking the test. A person may respond to the questions based on what he wants to be or how he perceives others view him rather than how he actually behaves. A final source of error is in the evaluation of the tests by the researcher. Tests scored by hand are prone to contain some degree of random error.

Suggestions for Further Research

The foremost need of further research is to replicate this study using a much larger sample size. Doing this would eliminate several of the limitations noted above and provide a broader base from which inferences could be made.

Another topic of research is to identify those factors involved in specialty choice and job tenure in addition to personality characteristics. Hajeck and Blumberg (1982) have already taken a step in this direction, but the factors need to be analyzed as to the weight they carry in these important behavioral decisions. Factors internal and external to the work enviornment need to be identified. One specific topic in this area to investigate is the impact of the physical work setting on laboratory workers' attitudes towards their job and effects on interpersonal relationships.

It would be useful to find or devise an index which could measure the degree of perceived or objective task structure in each specialty. This index could be tested for correlation with the personality indices and the types in order to provide support or a rebuttal of the theory.

A final area of useful research would be to devise a multiple regression model based on relevant factors such as personality and task structure which would predict outcomes including turnover, absenteeism, stress, incidence of job related injuries and so on. Such models would be highly useful to managers in identifying the more significant causes of these dysfunctional outcomes and in predicting and measuring the effectiveness of actions taken to alleviate them.

CONCLUSION

The data and subsequent analyses revealed a number of facts. The set of personality characteristics for the sample were consistent with findings of previous personality studies performed on laboratory workers. The majority of the subjects were the types ISTJ, ESTJ, ISFJ, and ESFJ. No personality differences were attributable to age or job classification, but the thinking/feeling index was related to sex. The index was not associated with either job tenure or choice of specialty. For this reason, the sample can be considered as a homogeneous group for the purpose of this study.

The specialty in which an individual prefered to work depended upon the judging/perceiving personality index alone. This index is an indication of the individual's need to have orderliness and structure in his environment and his tolerance to ambiguity. Judging types, who desire the most structure and tolerate the least ambiguity, were most often attracted to chemistry, urinalysis, and hematology specialties. Perceiving types, on the other hand, were attracted to the less structured specialties of blood bank, immunology, and microbiology. The data also revealed that most subjects were in the specialty which they desired to be rather than being in one they were compelled to choose. None of the other demographic variables interacted with the personality influence on this decision.

The indices EI, SN, and JP were correlated with job tenure. Individuals who possessed the introverted, sensing, and judging traits tended to have greater accumulated laboratory experience than those who possessed the extroverted, intuitive, and perceiving traits.

APPENDIX A

DESCRIPTIONS OF THE SIXTEEN MBTI TYPES

APPENDIX A

Descriptions of the Sixteen MBTI Types

ESTJ: Prefers to use thinking to organize and direct immediate environment as much as possible; abhors confusion, inefficiency, and anything aimless and ineffective; a realist, matter-of-fact, practical; judges too hastily; prefers to work with ideas and plans based on fact.

ENTJ: Similar to ESTJ but less realistic; sees the possibilities of a situation; has more insight and tolerance of theory.

ISTP: Prefers to use thinking to analyze environment, but not direct it; organizes facts and ideas, not people or things; unsociable; a realist; great capacity for facts and details; good at applied science; likely to be patient, accurate, and possess good motor skills.

INTP: Similar to ISTP but not a realist; values facts only for their relation to theory; good at pure science or research; impersonal; likely to have insight, ingenuity, quick understanding, and intellectual curiosity; more interested in finding solutions than putting them into practice.

ESFJ: Concerned chiefly with people; sociable and sympathetic; likes to have matters decided and settled; persevering, conscientious and orderly; practical, realistic, matter-of-fact, conerned with the present; adapts well to routine.

ENFJ: Similar to ESFJ but has more curiosity for new ideas, more insight, and concern for the future; able to express himself well verbally and in writing.

ISFP Realistic, sympathetic, compassionate, tolerant, open-minded, flexible, and adaptable, sees the needs of the moment; works well at jobs requirng devotion.

INFP: Similar to ISFP but less of a realist; dislikes details; interested in books and languages; visionary and possesses a gift for self expression.

ESTP: An adaptable realist; good-naturedly accepts and uses the facts around him; attentive to details; patient and easygoing; adept at working with machinery; not particularly dependable.

ESFP: Also an adaptable realist but has more tact and sympathy; likes to work with details; not very disciplined with himself or others; more artistic.

ISTJ: Super-dependable; practical and realistic; remembers and uses facts and previous experiences; has a low tolerance for ambiguity; systematic, hard-working, and patient with detail and routine in his work; emphasizes analysis, logic, and decisiveness.

ISFJ: Similar to ISTJ but emphasizes loyalty, consideration and the common welfare; has more tact and sympathy.

ENTP: Impersonal; an enthusiastic innovator; adaptable and tolerant of ambiguity; independent; a non-conformist; dislikes details and often fails to complete a task; insightful.

ENFP: Similar to ENTP but more enthusiastic and more concerned with people; skillful with dealing with people; deeply insightful and artistic or creative.

INTJ: An outstanding innovator in the field of ideas and principles; visionary and a hard driver towards those goals; perservering and impersonal; independent; a relentless organizer who dislikes a lack of order and an unsystemized approach; unconcerned with details.

INFJ: Equally outstanding innovator but less individualistic; more apt to win cooperation from others rather than demand it; sympathetic and skillful with dealing with people; also perservering and an effective organizer.

APPENDIX B

COVER LETTER FOR THE QUESTIONNAIRE AND THE MBTI TEST

APPENDIX B

Cover Letter for the Questionnaire and the MBTI Test

Dear Colleague,

Thank you for voluntarily participating in this study. The attached questions will be used in my thesis research. With your cooperation, I will be able to determine if medical technologists and medical laboratory technicians prefer to work in a laboratory specialty that matches their personality. This information can be used by anyone associated with the medical laboratory, including yourself, for examining career choices, job satisfaction, motivation and much more.

Your participation will be beneficial to all of us. Please be honest with your responses and answer all questions. Please read the instructions carefully before starting. The test will take no longer than 20 minutes to complete. There are no right or wrong answers, just select the one that describes you best. To insure complete confidentiality, DO NOT PUT YOUR NAME ON THE TEST BOOKLET OR THE ANSWER SHEET; rather make a note of this number _____. This code number will allow you and only you to obtain the results of this study and know to whom they apply. If you wish to know your personality type and a description of that type, please check here ____ and this information will be sent to you through the medical technology program director here at your hospital when the analyses are complete. Remember, only you will know your number, so please don't forget it. A short summary of the research findings will be sent to the program director when completed for distribution to those who are interested. Thank you again.

Sincerely,

Danny J. Sharon, M.T.(ASCP)

APPENDIX C

QUESTIONNAIRE FOR OBTAINING THE DEMOGRAPHICS, THE CURRENT SPECIALTY, AND PREFERRED SPECIALTY OF THE RESPONDENTS

APPENDIX C

Questionnaire

Answer these questions before proceding to those in the booklet. Respond to every question as they are all important to the study.

1. Sex: Male_____ Female_____

2. Age: 20-25_____ 25-30_____ 31-55_____ over 55_____

3. Current Job Classification (check one)

   Medical Technologist (or equivalent) _____

   Medical Laboratory Technician (or equivalent) _____

   Other (specify) _____

4. Indicate your total amount of laboratory work experience in years. Do not include time as a student in the laboratory.

   _____

5. What specialty are you currently working in (check one)

   Chemistry/Urinalysis _____

   Hematology/Coagulation _____

   Immunohematology/Immunology _____

   Microbiology _____

6. Based on what you know about a specialty, which one would you prefer to work in if given a choice? (Select one even if you are not sure that you prefer any one specialty. Select your current specialty if that is what you prefer.)

   Chemistry/Urinalysis _____

   Hematology/Coagulation _____

   Immunohematology/Immunology _____

   Microbiology _____

You may now proceed to the question booklet. Read the instructions carefully before responding. Thank you.

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